

## Letter of Transmittal

DOCKET 09-AFC-8

**DATE** FEB 02 2010

**RECD**. FEB 04 2010

Date: February 1, 2010

To: California Energy Commission Attention: Docket No. <u>09-AFC-8</u> 1516 Ninth Street, MS-4 Sacramento, CA 95814-5512 From: Michele Scott WorleyParsons 2330 East Bidwell, Suite 150 Folsom, CA 95630

(916) 817-3940

Dear Sir or Madam,

Pursuant to the provisions of Title 20, California Code of Regulation, WorleyParsons, consultant to Genesis Solar, LLC, hereby submits the Genesis Solar Energy Project Draft Channel Maintenance Plan. The Genesis Solar Energy Project is a 250 megawatt solar electric generating facility to be located between the community of Desert Center and the city of Blythe in eastern Riverside County, California.

This report is submitted as a supplementary report and accompanying data to the Genesis Solar Energy Project Application for Certification and Genesis Solar Energy Project Application for Certification Data Requests, Sets 1A and 1B. A hard copy and electronic copy (CD) are included herein.

Please feel free to contact me with any questions or concerns at (916) 817-3940.

Sincerely,

WorleyParsons

Michele Scott

Senior Compliance Manager

Jechela of fath



## BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA 1516 NINTH STREET, SACRAMENTO, CA 95814 1-800-822-6228 – WWW.ENERGY.CA.GOV

## APPLICATION FOR CERTIFICATION FOR THE GENESIS SOLAR ENERGY PROJECT

#### Docket No. 09-AFC-8

#### PROOF OF SERVICE (Revised 1/04/10)

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#### **DECLARATION OF SERVICE**

I, Michele Scott, declare that on February 1, 2010, I served and filed copies of the attached Genesis Solar Energy Project Draft Channel Maintenance Plan, dated January, 2010. This document is being submitted by the applicant, Genesis Solar LLC. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at:

[http://ww.energy.ca.gov/sitingcases/genesis\_solar].

The documents have been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(Check all that Apply)

	FOR SERVICE TO ALL OTHER PARTIES:
Х	sent electronically to all email addresses on the Proof of Service list;
X	by personal delivery or by depositing in the United States mail at Sacramento, California with first-class postage thereon fully prepaid and addressed as provided on the Proof of Service list above to those addresses <b>NOT</b> marked "email preferred."
AND	
	FOR FILING WITH THE ENERGY COMMISSION:
Х	sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below ( <i>preferred method</i> );
OR	
	depositing in the mail an original and 8 paper copies, as follows:
	CALIFORNIA ENERGY COMMISSION

Attn: Docket No. <u>09-AFC-8</u> 1516 Ninth Street, MS-4 Sacramento, CA 95814-5512 docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct.

Original Signed By: Michele Scott

## **GENESIS SOLAR ENERGY PROJECT**

## **DRAFT CHANNEL MAINTENANCE PLAN**

Submitted to:

California Energy Commission

Submitted by:

Genesis Solar, LLC

With technical assistance from:

WorleyParsons Group, Inc.

January 2010

#### DRAFT CHANNEL MAINTENANCE PLAN GENESIS SOLAR ENERGY PROJECT

Prepared By:			
Janine Forrest	Date		
Reviewed By:			
Bob Anders, California with expertise in hydro Plan".	•	•	 •
Bob Anders, PE,	 Date		

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#### 1. INTRODUCTION

This report presents a Draft Channel Maintenance Plan for the proposed Genesis Solar Energy Project ("Project"), located in the Colorado Desert between the communities of Blythe, CA (approximately 24 miles east) and Desert Center, CA (approximately 27 miles west) (refer **Figure 1**).

Genesis Solar, LLC, is proposing to construct, own and operate the Project on an approximate 1,800-acre site near Ford Dry Lake in Riverside County, California (refer **Figure 1**). The Project is a concentrated solar power (CSP) electric generating facility that will use a proven parabolic trough solar thermal technology. The troughs will concentrate the sun's heat on tubes carrying a petroleum-based Heat Transfer Fluid (HTF) that will be used for steam production. The steam in turn will be used to power a steam turbine generator.

As part of the Genesis Solar Energy Project, it is proposed to divert the off-site watershed using diversion channels/berms. (refer **Figure 2**).

- Flows from the sub-basin 1 (north-western) will be diverted through a channel on the west side of the west 125 MW module;
- Flows from sub-basin 2 (north) will be diverted through a channel between the two 125 MW modules; and
- Flows from sub-basin 3 (north-eastern) will be diverted though a channel along the east side of the east 125 MW module.

Maintenance of the channels will be accomplished as part of the ongoing operations and maintenance of the plant and its facilities. Subcontracted specialists will be engaged as needed to perform specific maintenance activities, and the below channel maintenance program will be implemented.

#### 1.1 PURPOSE AND OBJECTIVES

The purpose of the diversion channels are to prevent interaction with off-site stormwater and onsite stormwater which will allow:

- Allow natural groundwater recharge of the off-site stormwater with no contact with the changed flow conditions of the on-site water;
- Protect the Site infrastructure from flash flood events, which have the potential to damage the solar parabolic troughs;
- Control treatment of the on-site flows from the solar collector array (location of heat transfer fluid within the solar parabolic troughs);
- Protect the Site from upstream sediment loading;

- Control on-site flows in detention basin to ensure there is no increase in post developed flow discharging from the site, minimizing the impact on downstream ephemeral drainage features;
- Maximize the developable area within the solar field;
- Maintain a passageway, particularly through the center channel (channel B/C) for animals that may move from north to south; and
- Develop an environment that is not inviting to fossorial animals (burrowing or living underground), to deter them from burrowing within the channel.

Therefore the objective of the draft channel maintenance plan:

- Maintain channel capacity, so the runoff from upstream watershed (approximately 90,000 acre) is conveyed within the channel in a 100 year, 24 hour storm event; and
- Maintain an environment within and around the channel that is not inviting to fossorial animals while maintaining the passageway if they do access the channel.

#### 2. CHANNEL CONDITIONS

#### 2.1 HYDROLOGY

The channels are design to contain the 100 year, 24 hour storm event within the channel. As shown in **Figure 2**, there are five channels on site which have the following estimated flows during the 100 year storm event:

	STORMWATER FLOW RATE (CFS)
Channel A	1,156.37
Channel B	4,086.17
Channel C	2,006.55
Channel B/C	6,092.72
Channel D	2,600.43
Channel E	253.75
Channel D/E	2,854.18

Typical cross sections of the channels are provided in **Appendix A**. All runoff diversion channels will be designed with a soil/cement mix or similar surface to prevent erosion by providing adequate protection against development of an uncontrolled low-flow thalweg or designed with a low flow channel to control any flow thawleg. The channels are designed with appropriate depth to width ratios and slope erosion control to prevent undercutting and head cutting within the channel.

#### 2.2 BIOLOGY

The slopes will be a maximum of 2H to 1V and the exposed slope protection surface will not be uneven (i.e. no exposed rip rap, gabions, etc) and therefore will not be a hazard to desert tortoises. There will be no vegetation within the channel to deter animal access however box culverts and drop structures, if used, are designed to allow the movement of animals if they do access the channels. The soil/cement mix or similar surface material of the diversion channels will limit fossorial animals ability to borrow.

#### 3. SUCCESS CRITERIA

The following is the success criteria of the channel draft maintenance plan:

- 100 year, 24 hour storm event run off is contained with the channel and daylights at the outlet, transitioning back into surface sheet flow;
- Berm prevents upstream stormwater run off from entering the Project site;
- No vegetation or debris in the base of the channel;
- Soil-cement lined areas of the base and slopes in good condition (no signs of erosion);

#### 4. INSPECTION AND MAINTENANCE REQUIREMENTS

#### 4.1 INSPECTION PROGRAM

The channels are to be inspected on a semi-annual basis (spring and fall) by the environmental compliance manager (ECM) for routine maintenance activities and after storm events. The inspections are to assess the following within the channel and along the banks:

- Erosion/sedimentation accumulation at the upstream inlet to the channel;
- Erosion/sedimentation accumulation at the downstream inlet to the channel;
- Erosion/sedimentation accumulation within the channel including development of an uncontrolled low-flow thalweg;
- Debris accumulation;

- Condition of the soil-cement lined channel base;
- Visual evidence of the stormwater overtopping the channel;
- Vegetation/weed management;
- Evidence of animal use within or around the channel (i.e. tortoise movement, animal tracks);
- Condition of grade control structures;
- Condition of the berm;
- Condition of the fencing (including any keystone block/reinforced concrete walls);
- Condition of the box culverts;
- Condition of the access roads; and
- · Condition of gates and signs.

The ECM will record the finds from the inspection, which will dictate the level of maintenance activities required.

Specially after a storm event, the ECM must note if the stormwater run off caused:

- Significant damage to the project, adjacent property or structural elements of the diversion channel;
- A public safety concern;
- Negatively affected groundwater recharge; or
- Negatively affected adjacent plant communities or posed a hazard to wildlife.

#### 4.2 MAINTENANCE PROGRAM

The maintenance program will be implemented after any deficiencies in the channel system are noted. Generally, routine maintenance will occur after the semi-annual site inspections or as needed after a storm event. Regular maintenance activities may include:

- Removal of all debris accumulation from the channel;
- Removal of accumulated sediment within the channel;
- Repairs to the soil-cement base or slopes if they have signs of erosion;
- Repairs to the culverts if they are not in adequate condition;
- Spraying of vegetation with a aquatic weed control herbicide to control its presence in the channel;
- Repairs to the fence if it is not in an adequate condition to prevent access to the channel;

- Repairs to the access road if it is not in an adequate condition to provide safe road vehicle access to the channel;
- · Repairs to the gates if they are not in working order;
- Repairs/replacement of signs if they are not readable.

Debris and sediment can be removed from the channel using equipment that will not damage the soil-cement base and slopes of the channel.

Soil-cement can flex with changes in soil pressures directly underneath the channel and cause cracks. In addition debris in flood flows may cause damage to soil-cement. If there has been any damage to the banks or base of the channel that is soil-cemented lined, the area would need to be isolated and repairs made. Minor cracks can be filled in or alternatively sections of the soil-cement can be cut out, soil-cement mixture relayed and compacted.

Cracks in the culverts can also be filled in using a portland cement-based mortar or a flexible sealing type material.

Weed control is required within and around the channel due to the presence of invasive weeds on the Genesis Solar LLC Facility. As the base of the channel may be soil-cement, it will not be expected to have any weeds. However, nutrient rich sediment that has dropped out during storm events may start growing weeds. There is a Site Weed Management Plan that addresses weed prevention and control around the project site. In addition, an aquatic weed control herbicide (such as Rodeo) will be sprayed in the base of the channel on a semi annual basis.

Repairs to the fence / gate / road / signage will all be undertaken on an as needed basis, as determined by the ECM and Facility Operator after the semi-annual inspection. The extent of repairs will be dependant on the level of degradation and assessment of its ability to meet its operational purpose and health and safety impact.

At the end of the Project life, it is expected that the channels will be restored to pre-project grades. Therefore a post project maintenance plan would not be required.

#### 5. EMERGENCY REPAIRS

Emergency repairs will be undertaken as needed to ensure the capacity of the channel is not restricted. Emergency repairs may be required over the life of the Project due to unforeseen collapses to berms, embankments or in-stream structures. Other structures that may need emergency repair work would be channel crossings and vertical walls (i.e. keystone block, reinforced concrete etc).

#### 6. REPORTING

A maintenance log will be kept by the ECM and maintained at the Genesis Solar LLC facility summarizing the inspections, maintenance activities, and any corrective actions taken including

emergency repairs. The log will also include the date of task (inspection / maintenance), who undertook the task and a description of the findings. If the task requires removal of sediment or debris, the location of where the sediment was removed from and location of where it was disposed will be recorded. The log will be on site and available to the CEC upon request.

By January 31st of each year, Genesis Solar LLC will submit an Annual Report to the appropriate regulatory agency including a summary of the inspection and maintenance activities, and any corrective actions taken including emergency repairs. The condition of the channels will be compared against the success criteria to determine any deficiencies in the maintenance program and the program updated accordingly.

#### 7. COST

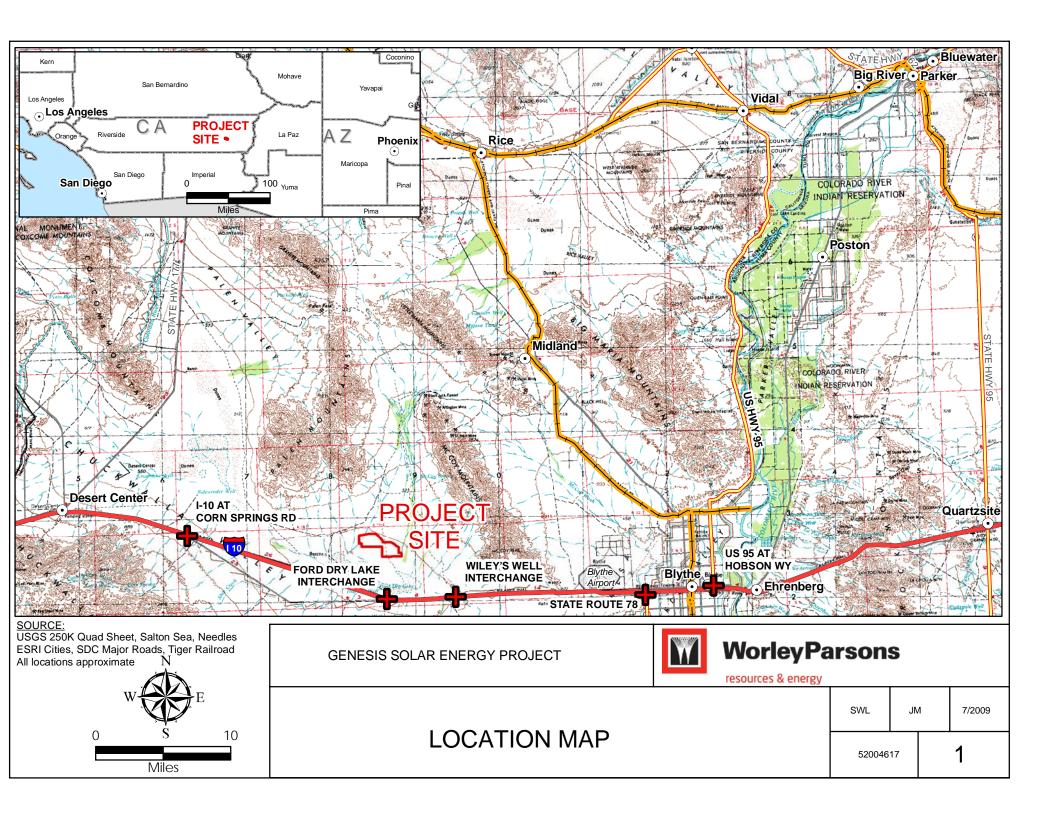
The annual cost of the maintenance program may be \$31,558 however this value will fluctuate depending on the volume of sediment and debris removed, and required repairs (i.e. to fences, signage, gates and access roads) (refer to **Table 1**).

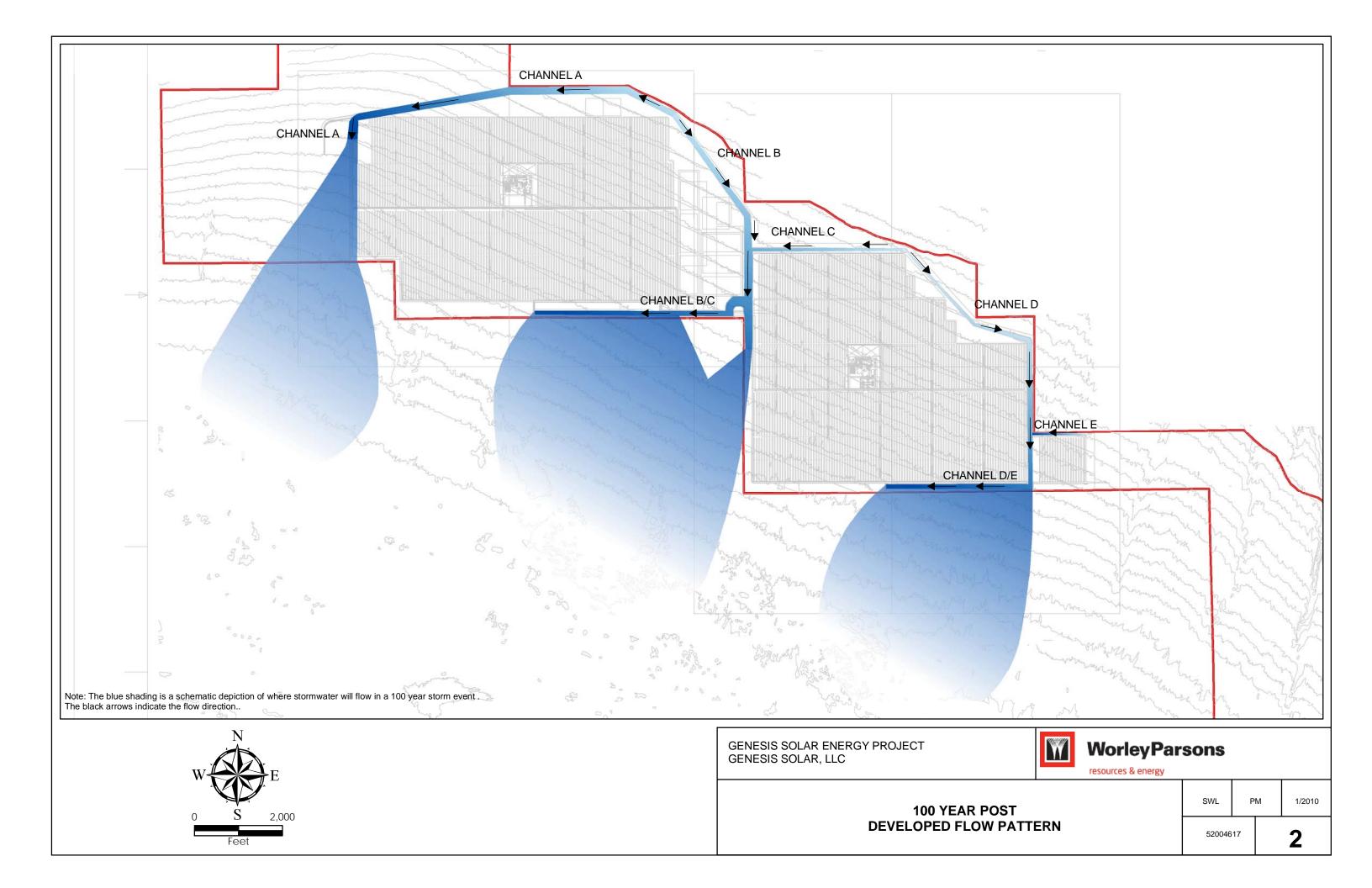
There are no planned capital improvement projects scheduled for the channel at this time. Any future capital improvement projects may impact this draft channel maintenance plan, therefore this plan will be updated as required to reflect the current conditions.

Genesis Solar LLC will have an allocation for channel maintenance, including emergency repairs, in their annual operating budget. If the annual budget is not fully used in any one year, then it may be rolled over to the following year's budget allocation as appropriate.

#### DRAFT CHANNEL MAINTENANCE PLAN GENESIS SOLAR ENERGY PROJECT

## **FIGURES**





#### DRAFT CHANNEL MAINTENANCE PLAN GENESIS SOLAR ENERGY PROJECT

### **TABLES**



# TABLE 1 ANNUAL MAINTENANCE COST ESTIMATE Gensis Solar Energy Project Draft Channel Maintenance Plan

ACTIVITIY	UNIT TYPE	ACTIVITY FREQUENCY PER YEAR	NO OF UNITS PER ACTIVITY	TOAL UNITS PER YEAR	UNI	T COST PER YEAR	SUB TOTAL	COST REFERENCE
Channel, Berm and Road Inspections - Quarterly	Labour	2	74.2	148.4	\$	30	\$ 4,452	Assume 1 hour to inspect one acre, 2 times per year
Channel Inspections - Wet Weather	Labour	2	37.1	74.2	\$	30	\$ 2,226	Assume 30 mins to inspect one acre, 2 times per year
Weed Control - Spray aqautic herbicide (Rodeo or equivalent)	Labour, Equipment and Materials	2	37.1	74.2	\$	100	\$ 7,420	Assume 2 people taking 30 mins to do one acre using an existing buggy, 2 times a year
Debris Collection and Removal	Labour	1	12	12	\$	30	\$ 360	Assume one removal activity per year in six different locations, each taking 2 hours of work
Sedimentation Removal and Disposal	Labour and Materials	As Needed					\$ 4,000	Estimated - may not be used every year or may require more depending on the required work
Reperations to fence, gate, signage and access road	Labour and Materials	As Needed					\$ 4,000	Estimated - may not be used every year or may require more depending on the required work
Emergency Repairs - as needed	Labour, Equipment and Materials	As Needed					\$ 4,000	Estimated - may not be used every year or may require more depending on the required work
Reporting - Annual	Report	1	60	60	\$	85	\$ 5,100	Assume 60 hours to undertake the annual report
TOTAL COST						Г	\$ 31,558	

#### Note

1. There are 74.2 acres of channel area, including the base and side slopes of the channel.

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DRAFT CHANNEL MAINTENANCE PLAN
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**APPENDIX A: GRADING AND DRAINAGE DRAWINGS** 

